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(56) Documents cited
GB 2130544 A GB 2049609 A GB 1018295 A
GB 0963181 A GB 0909101 A GB 0618629 A
GB 0495275 A GB 0354222 A WO 80/00246 A

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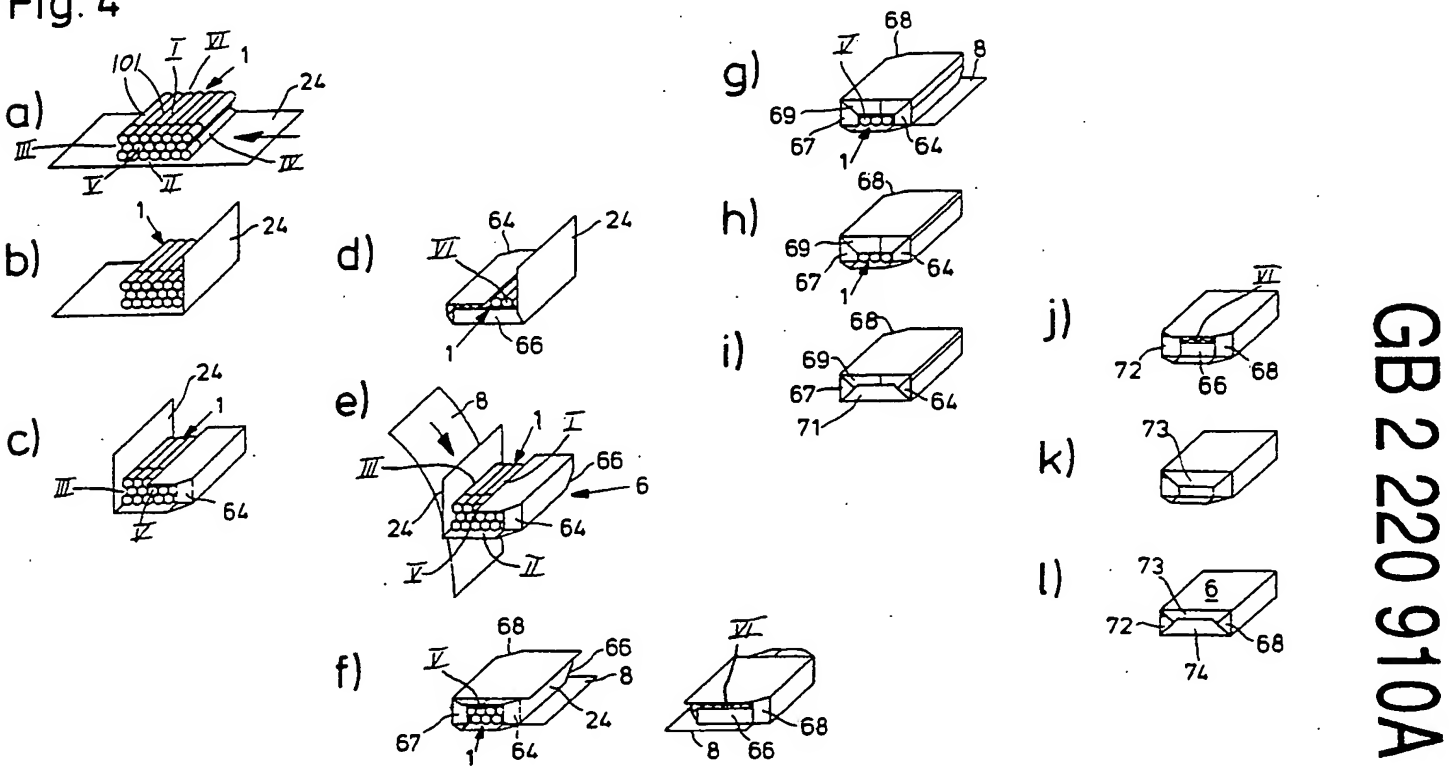
CW1 CW5 CW6
INT CL⁴ B65B, B65D

(54) Method of making cigarette packs and the like

(57) Soft cigarette packs are formed by draping block-shaped arrays of plain or filter cigarettes first into a metallic inner blank 24 which is converted into a tube surrounding the two major sides and the elongated narrow sides of the respective array and has end portions extending beyond the top and bottom ends of the array. A non-metallic second blank 8 is placed against one panel of the inner blank before the conversion of inner blank into a tube is completed, and several following folding steps which result in conversion of the first and second blanks into inner and outer envelopes of the soft pack are carried out, some of the folding steps being effected jointly on the two blanks to provide jointly folded wide and narrow flaps 68, 72, 73 e.g. at bottom end of the finished soft pack composed of both blanks.

Fig. 4



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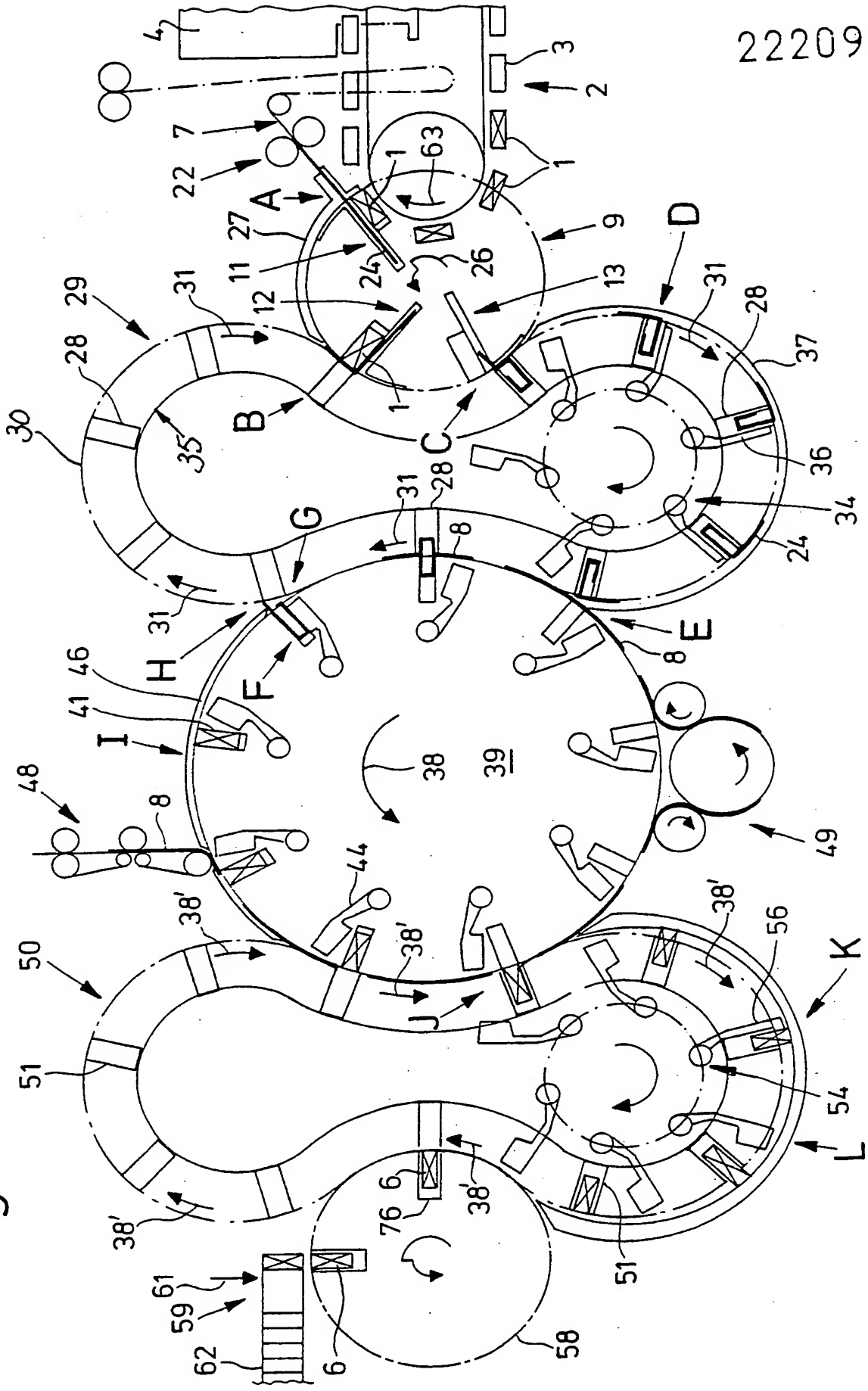
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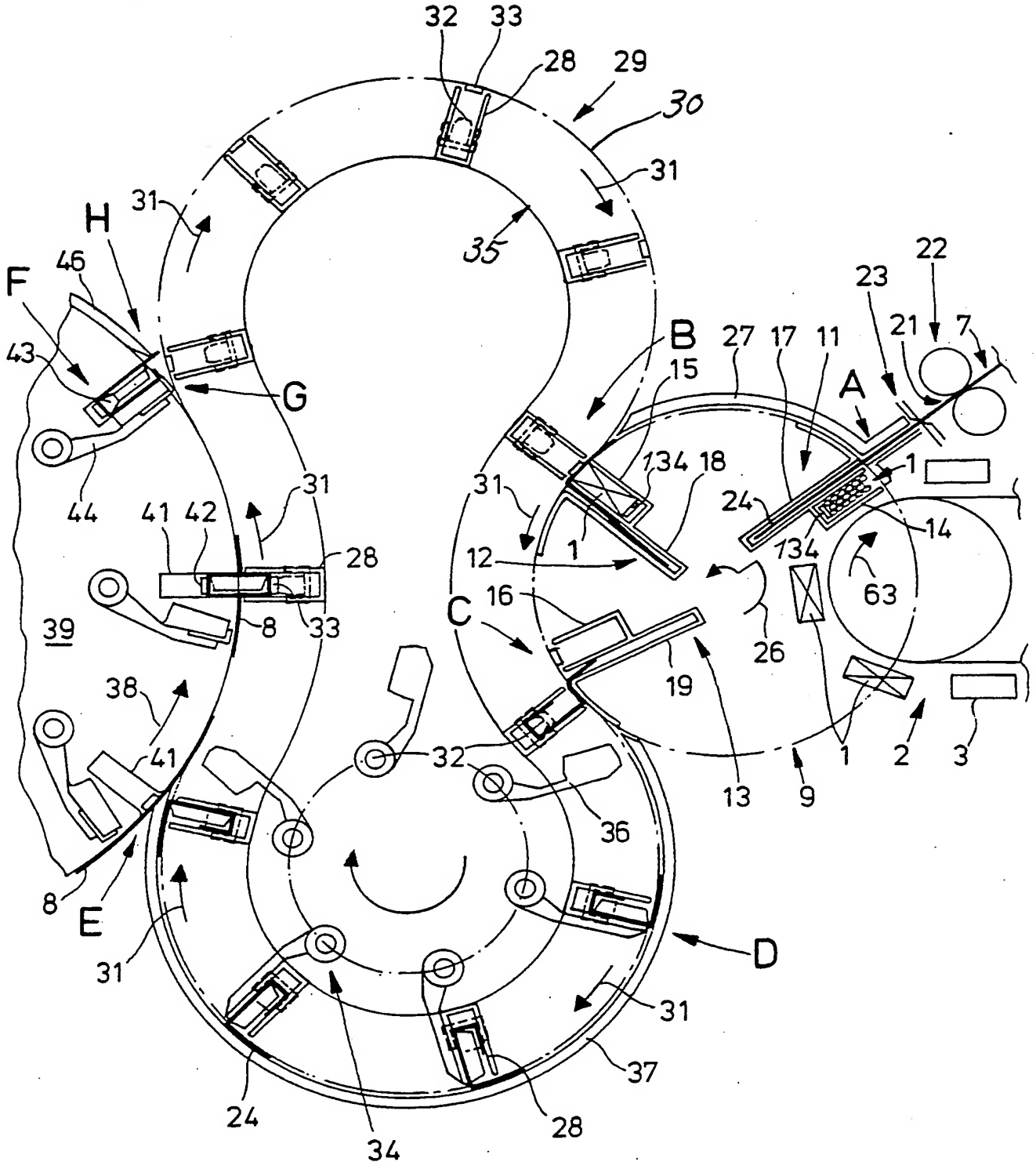
Fig. 1

Fig. 2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C
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12
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31
B
15
134
18
27
17
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Fig. 3

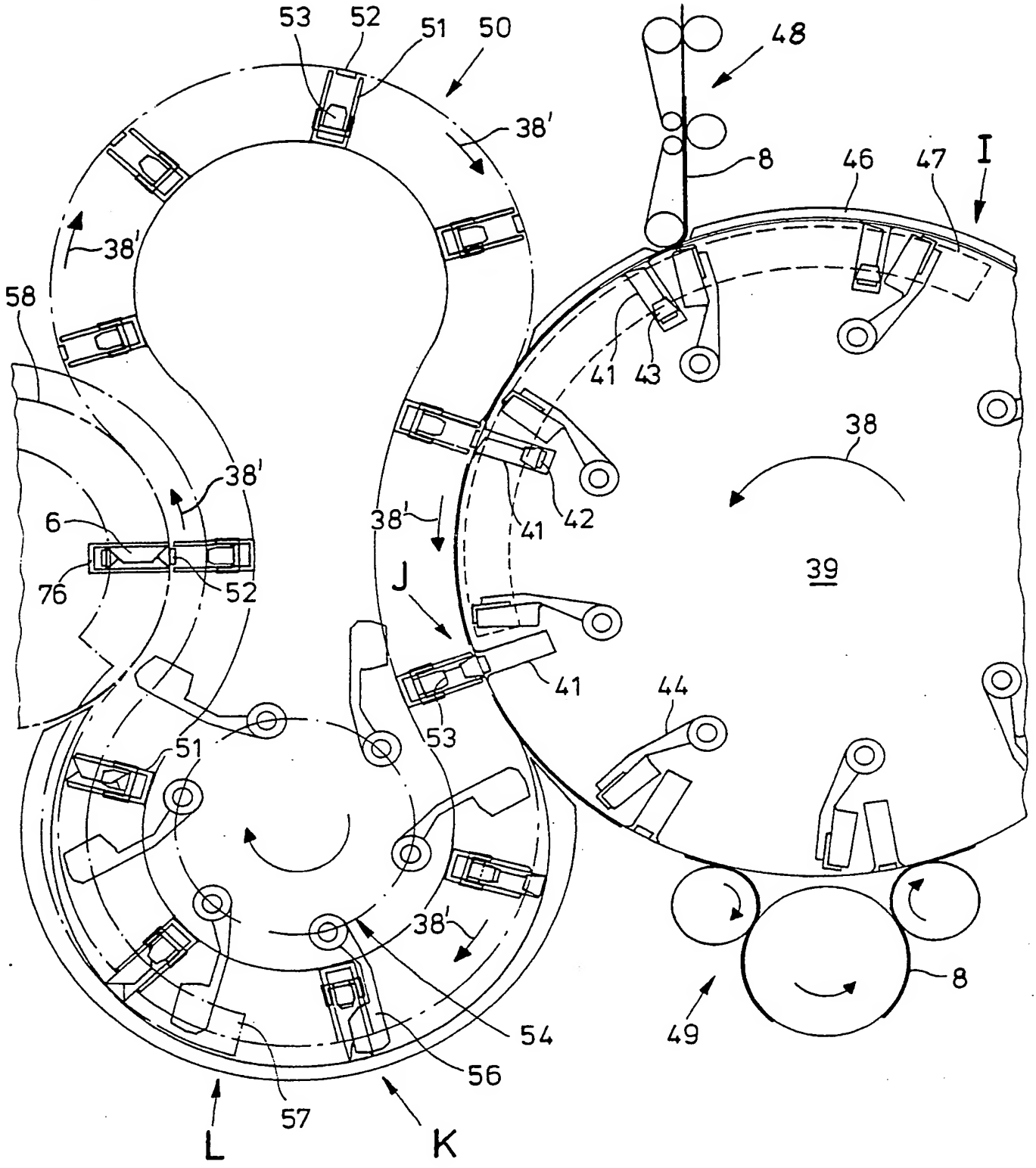
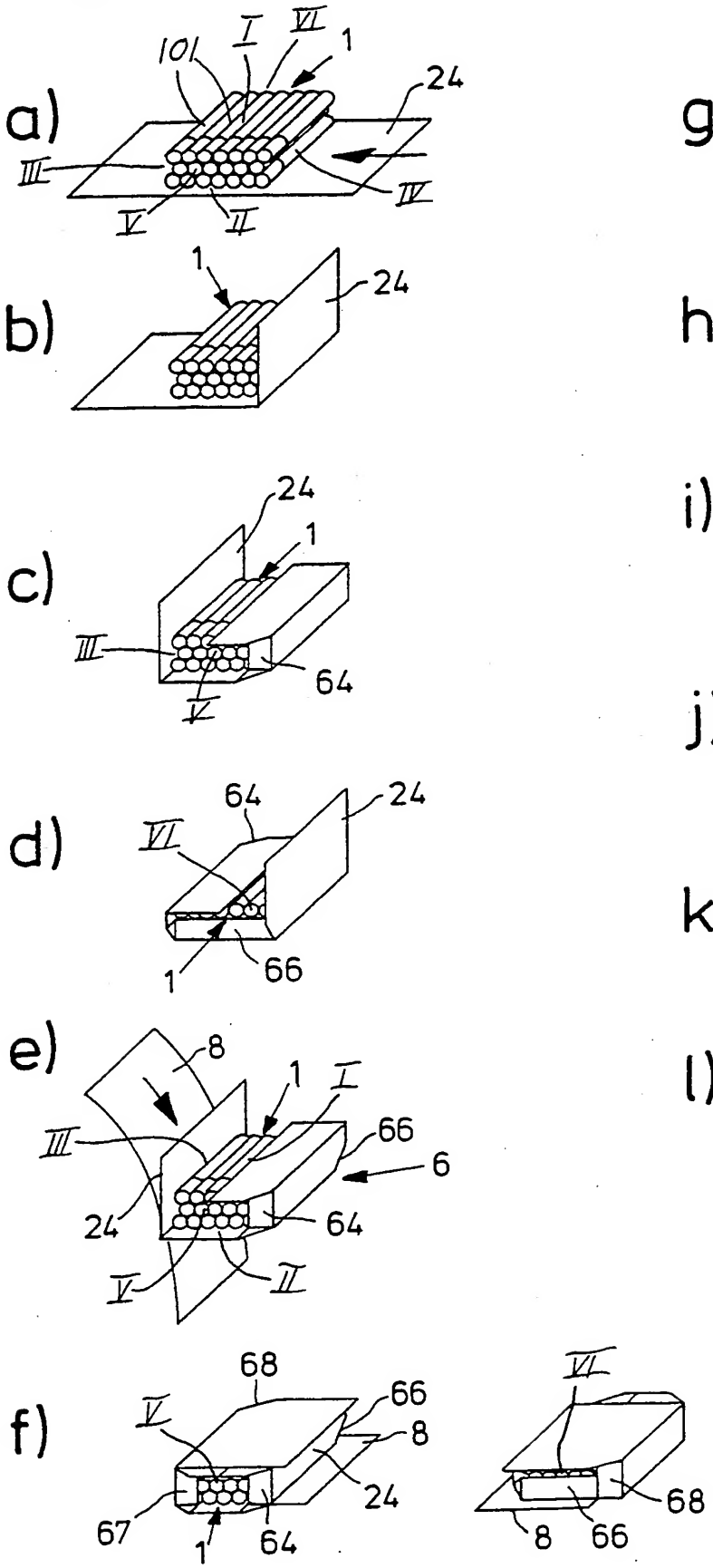


Fig. 4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b)
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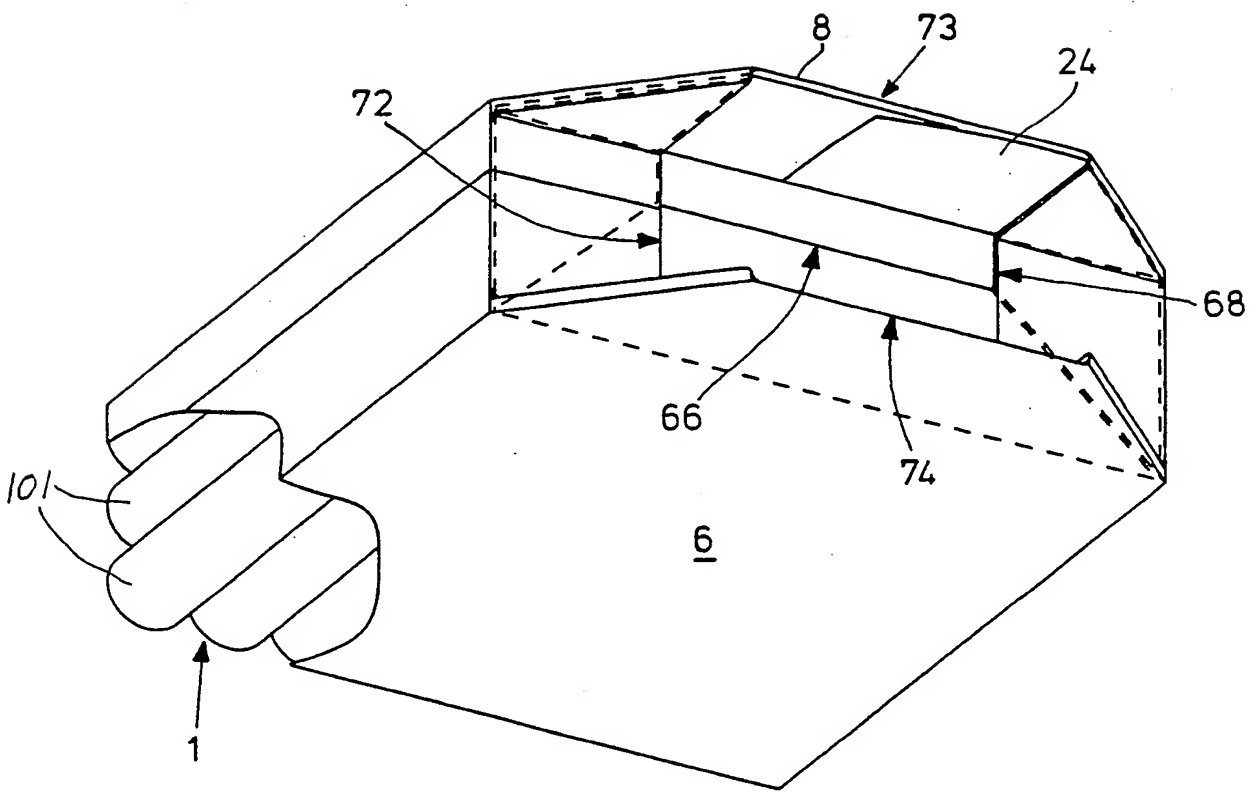
Fig. 5



METHOD OF MAKING CIGARETTE PACKS AND THE LIKE

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The invention relates to improvements in methods of making packs which contain cigarettes or other rod-shaped articles of the tobacco processing industry. More particularly, the invention relates to improvements in methods of draping two or more foldable blanks around block-shaped (right parallelepipedal) commodities which consist of or include arrays of parallel plain or filter cigarettes, cigars, cigarillos, cheroots or other rod-shaped smokers' articles.

It is well known to form packs of cigarettes or other rod-shaped smokers' articles by draping two or more blanks of paper, metallic foil, plastic foil, cardboard or like wrapping material around arrays of parallel rod-shaped articles. The arrays may but need not be in the so-called quincunx formation (which is popular in the United States of America), and such arrays can consist of groups of, for example, four, five, ten, twenty or twentyone rod-shaped articles. The presently preferred mode of making packs (hereinafter called cigarette packs with the understanding, however, that the method can be practiced with equal or similar advantage in connection with the making of packs which contain plain or filter cigars, plain or filter cigarillos or other rod-shaped articles of the tobacco processing industry) is to use a metallic foil (such as aluminum foil or tin foil) for the making of an inner envelope which directly contacts and surrounds the array of cigarettes, and to use an outer envelope which consists of paper, cardboard or plastic and surrounds the inner envelope.

In accordance with heretofore known methods, a first blank is converted into a tube which surrounds the two major sides and the two elongated narrow sides of an array of rod-shaped articles (such narrow sides alternate with the two major sides) and the end portions of which

extend beyond the head and bottom ends of the array, and the projecting end portions are then folded against the respective ends of the array to form two wide flaps adjacent the major surfaces and two narrow flaps adjacent the narrow surfaces of the array. The thus completed inner envelope is thereupon confined in an outer envelope which is made of a second blank and is formed in the same way as the inner envelope, i.e., the second blank is converted first into a tube which surrounds the inner envelope along the major and narrow sides of the array, and the projecting end portions of the thus obtained outer tube are thereupon folded to form pairs of wide and narrow flaps at the top and bottom ends of the array. The flaps of the thus obtained outer envelope are outwardly adjacent the flaps of the inner envelope. The just outlined method of making cigarette packs is time-consuming because it comprises a very large number of steps including a first set of steps which must be carried out to convert the first blank into the inner envelope and a second set of steps which must be carried out to convert the second blank into the outer envelope of the pack.

One feature of the present invention resides in the provision of a method of draping at least two foldable blanks around a box-shaped commodity which contains parallel rod-shaped articles of the tobacco processing industry and has two major sides, two narrow sides which alternate with the major sides, a top end and a bottom end. The method comprises a plurality of first folding steps which are carried out to convert the blanks into tubes one of which surrounds the other tube and which surround the major and narrow sides of the commodity and have end portions projecting beyond the top and bottom ends of the commodity, and a plurality of second folding steps which serve to move the end portions of the tubes against the respective ends of the commodity. In accordance with a feature of the invention, at least two of the folding steps include jointly folding the at least two blanks, i.e., at least two steps of converting certain portions of one of the blanks into certain portions of an envelope can be carried out simultaneously with the steps of converting the corresponding portions of the other blank into certain portions of an envelope.

At least one of the at least two jointly performed folding steps is or can be one of the first folding steps.

The at least two jointly performed folding steps can include two of the second folding steps.

The first and second folding steps include conversion of one of the at least two blanks into an inner envelope which is adjacent the commodity and conversion of the other of the at least two blanks into an outer envelope which surrounds the inner envelope. The first folding steps can include partial conversion of the one blank into a tube prior to start of conversion of

the other blank into a tube. Also, the first folding steps can include the step of completing conversion of the one blank into a tube, and such completing step can constitute one of the at least two jointly performed folding steps.

One of the at least two folding steps can include converting the other blank into a substantially U-shaped body preparatory to conversion of such body into a tube.

The second folding steps can include four steps of folding the projecting end portions of the tubes against the bottom end of the commodity, and three of such four steps can include jointly folding the at least two blanks. The four second folding steps can include converting the projecting end portions of the tubes of the at least two blanks into two relatively wide first flaps adjacent the major surfaces of the commodity and two relatively narrow second flaps adjacent the narrow sides of the commodity. The three of four steps preferably include the making of the two relatively narrow second flaps and the making of one of the two relatively wide first flaps.

Another feature of the invention resides in the provision of a pack or packet comprising a box-shaped commodity which contains parallel rod-shaped articles of the tobacco processing industry and has two major sides, two narrow sides alternating with the major sides, a top end and a bottom end, and at least two envelopes one of which preferably directly and closely surrounds the commodity and the other of which closely surrounds the one envelope. Each of the two envelopes has four flaps overlying one end of the commodity (particularly the bottom end), and at least one flap of the one envelope is interfolded or interfitted with at least one flap of the other envelope. In other words, such flaps do not merely

overlie each other but are form-lockingly connected to each other as a result of joint folding of the respective parts of corresponding end portions of the tubes (i.e., of partially converted blanks).

The four flaps of each of the two envelopes include two relatively wide flaps which are adjacent the major sides and two relatively narrow flaps which are adjacent the narrow sides of the commodity. The at least one flap of each of the two envelopes can constitute one of the relatively wide flaps. The other relatively wide flaps of such envelopes preferably overlie the interfolded or interfitted relatively wide flaps.

The at least one flap of the one envelope is fitted into the at least one flap of the other envelope.

One of the envelopes can constitute or include a metallic foil (e.g., an aluminum foil or a tin foil). The other envelope can contain a nonmetallic material, such as cardboard, paper or plastic foil or board.

The commodity can contain an array of rod-shaped articles in quincunx formation.

Each envelope preferably comprises two wide and two narrow flaps at each end of the commodity. One wide flap of each envelope overlies the adjacent narrow flaps at each end of the commodity, and the other wide flap overlies the one wide flap at each end of the commodity.

Each pack can be further provided with a revenue label which can overlie the outer envelope across one end and along portions of the two major surfaces of the confined commodity.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The improved pack itself, however, both as to its construction and the mode of making the same, together with additional features and advantages thereof, will be best understood upon perusal

of the following detailed description of certain presently preferred specific embodiments of the method with reference to the accompanying drawing.

FIG. 1 is a schematic elevational view of a packing machine which can be utilized for the practice of the improved method;

FIG. 2 is an enlarged view of the structure which is shown in the right-hand part of FIG. 1;

FIG. 3 is an enlarged view of the structure which is shown in the left-hand part of FIG. 1;

FIGS. 4a to 4l illustrate successive stages of draping an array of filter cigarettes into inner and outer blanks in accordance with the improved method; and

FIG. 5 is an enlarged perspective view of a partially finished pack.

The packing machine which is shown in FIG. 1 serves to make packs or packets 6 each of which comprises a block-shaped or right parallelepipedal commodity 1 (see also FIG. 4a) consisting of twenty parallel filter cigarettes 101 in quincunx formation, namely having two outer layers of seven cigarettes each and a median layer of six cigarettes with the cigarettes of the median layer staggered relative to the cigarettes of the outer layers. Each commodity 1 has two major sides I and II, two narrow sides III and IV which alternate with the major sides, a top end V, and a bottom end VI. The commodities 1 are formed in the cells 3 of an endless chain conveyor 2 which advances its cells stepwise past a magazine 4 containing a supply of parallel filter cigarettes 101 and provided with a number of chutes which discharge rows of filter cigarettes in a manner as disclosed, for example, in commonly owned U.S. Pats. Nos. 4,503,967 (granted March 12, 1985 to Erdmann et al.), 4,471,866 (granted September 18, 1984 to Erdmann et al.) and 4,362,235 (granted December 7, 1982 to Erdmann). The disclosures of these patents are incorporated herein by reference.

The making of packs 6 involves draping of successive commodities 1 into inner envelopes which constitute converted metallic blanks 24 and into outer envelopes which constitute converted nonmetallic blanks 8. The blanks 24 are obtained by repeatedly severing the leader of a continuous web 7 of metallic foil (e.g., aluminum foil or tin foil). The packs 6 are assumed to be so-called soft packs, i.e., the blanks 8 which are converted into outer envelopes consist of paper or similar readily flexible material. The conversion of each blank 24 and 8 into an envelope involves the transformation of the respective blank into a tube which surrounds the major sides I, II and the narrow sides III,

IV of the respective commodity 1 and has end portions projecting beyond the top and bottom ends V and VI of the commodities, and conversion of projecting ends into pairs of relatively wide flaps adjacent the major sides I, II and pairs of relatively narrow flaps adjacent the narrows sides III, IV at each end of the respective commodity.

The packing machine of FIG. 1 comprises a first conveyor 9 which is a rotor having three substantially radially extending arms 11, 12 and 13. The arms 11 to 13 are driven independently of each other and discontinuously at a plurality of different speeds including zero speed and a substantially constant speed. The arms 11, 12 and 13 respectively comprise parallelepiped pockets or receptacles 14, 15 and 16 each of which can receive a commodity 1 and each of which is open at its radially outermost side and at one axial end of the rotor 9 for reception of a commodity 1 from the registering cell 3 of the chain conveyor 2. The radially outermost sides of the pockets 14 to 16 are open to permit expulsion of commodities 1 from the respective pockets by discrete expelling members in the form of pushers 134 (FIG. 2) which are movable in the pockets substantially radially of the rotor 9 and are inwardly adjacent the commodities 1 which are confined in the respective pockets.

Each of the arms 11 to 13 further comprises a substantially radially extending flat receptacle of pocket 17, 18, 19, respectively (hereinafter called pouch to distinguish from the pockets 14 to 16), and each such pouch is adjacent one major side of the respective pocket 14, 15 or 16. The purpose of the pouches 17-19 is to individually receive the leader of the metallic web 7 and to thereupon advance a discrete blank 24 which is obtained as a result of severing of the leader of the web 7 while the respective pouch registers with the nip 21 of

two advancing rolls 22 which serve to intermittently feed the web 7 in a direction substantially toward the axis of rotation of the rotor 9. A severing or cutting device 23 is provided to intermittently sever the web 7 so as to form a series of discrete blanks 24. The pouches 17-19 are flat and extend substantially at right angles to the direction (arrow 26) of intermittent orbital movement of the respective pockets 14-16. When the rotor 9 is arrested, the open radially outermost end of one of the pouches 17-19 is in register with the nip 21 of the advancing rolls 22 at a station A where the respective pocket 14, 15 or 16 receives a commodity 1 from the registering cell 3 of the chain conveyor 2. The conveyor 2 advances its cells 3 in a plane which is adjacent that axial end of the rotor 9 where the pockets 14-16 are open so that a pusher (not shown) at the station A can transfer a commodity 1 from the cell 3 into the adjacent pocket 14, 15 or 16 by moving such commodity in parallelism with the axis of the rotor 9 toward or away from the observer of FIGS. 1 and 2. At such time the respective pusher 134 is held in the fully retracted position in the radially innermost portion of the respective pocket. The advancing rolls 22 draw the web 7 off a reel or button (not shown) or from any other suitable source of supply. The cutting device 23 is actuated in automatic response to advancement of a predetermined length of the web 7 into the adjacent pouch 17, 18 or 19, e.g., when the front edge face of the web 7 contacts the surface in the radially innermost portion of the pouch which is aligned with the nip 21 of the advancing rolls 22, or in response to a predetermined angular movement of the advancing rolls 22 in the direction to move the web 7 toward the axis of the rotor 9. When the cutting operation is completed, the respective pouch (note the pouch 17 at the station A in

FIG. 2) contains a metallic blank 24 having a predetermined size and shape. The mutual positions of such blank and of the commodity 1 in the adjacent pocket (note the pocket 14 at the station A in FIG. 2) are shown in FIG. 4a.

The station A is followed by a second station B which is located downstream of the station A (as seen in the direction of arrow 26). The arm (such as 11) which advances from the station A to the station B is accelerated from zero speed (at A) to the speed of movement of a second conveyor 29 which resembles the number eight and is continuously driven in the direction of arrows 31 at a speed which is reached by the arm 11, 12 or 13 when the arm has advanced from the station A to the station B.

A stationary arcuate folding member 27 is adjacent the path of movement of the radially outermost portions of pouches 17-19 from the station A to the station B to fold those portions of blanks 24 which extend radially outwardly beyond the respective pouches. Note that the cutting device 23 is spaced apart from the radially outermost portion of the pouch at the station A so that each blank 24 includes a radially outermost portion which extends from the pouch and is automatically folded by the member 27 during movement of the respective pouch from the station A to the station B. This results in conversion of the blank 24 into an L-shaped body (FIG. 4b) and is one of the (first) folding steps which are carried out in order to convert the blank 24 into a tube which surrounds the major sides I, II and the narrow sides III, IV of the respective commodity 1 and has end portions projecting beyond the top end V and beyond the bottom end VI of such commodity.

The station B is followed by a station C (again as seen in the direction of arrow 26). The arm 11, 12 or

13 which advances from the station B toward the station C is transported at the exact speed of the adjacent portion of the second conveyor 29. That portion of the path for the conveyor 29 which extends from the station B to the station C forms part of a circle having its center of curvature on the axis of rotation of the rotor (first conveyor) 9.

The second conveyor 29 has equidistant receptacles or pockets 28 which advance at a constant speed in the direction of arrows 31 and each of which receives a commodity 1 and a portion of the partially converted blank 24 at the station B or during movement from the station B toward the station C, namely when a pocket 28 and the pocket 14, 15 or 16 of the adjacent arm 11, 12 or 13 advance in the same direction and at the same speed. The transfer of commodities 1 from the pocket 14, 15 or 16 into the registering pockets 28 is effected by the respective pushers 134 which are caused to move radially outwardly so that the respective commodities leave their pockets (14, 15 or 16) by way of the open radially outermost ends of such pockets and enter the adjacent pockets 28 by moving radially outwardly of and beyond the path for the pockets 14 to 16. The second conveyor 29 can include an endless chain 30 and can be constructed, mounted and driven in a manner as disclosed in the aforementioned commonly owned copending patent application Serial No. 207,294 of Deutsch or in the aforementioned commonly owned copending patent application Serial No. 216,322 of Deutsch. Portions of the chain conveyor 30 are trained over suitable sprocket wheels one of which is shown at 35.

That end of each pocket 28 which faces away from the observer of FIG. 1 or 2 is adjacent a small folding member 32 (indicated in FIG. 2 by broken lines) which serves to fold a part of one projecting end portion

of the blank 24 which is being introduced into the respective pocket 28. This results in the formation of a narrow flap 64 (FIG. 4c) which is adjacent the top end V of the respective commodity 1. It will be seen that at least one of the (second) folding steps which involve the making of flaps at the top and bottom ends V and VI of a commodity 1 can take place prior to completion of the (first) folding steps which serve to convert a blank 24 into a tube (a tube is shown in FIG. 4f).

Each pocket 28 of the second conveyor 29 (i.e., of the chain conveyor 30) contains a reciprocable pusher 33 which moves radially inwardly during or prior to introduction of a commodity 1 with the associated partially deformed blank 24 and moves radially outwardly in order to expel the commodity 1 and the blank 24 from the respective pocket 28.

When one of the arms 11 to 13 reaches the station C, it is decelerated (either gradually or stepwise) so that its speed is zero when it returns to the station A and places the open end of its pouch 17, 18 or 19 into alignment with the nip 21 of the advancing rolls 22. Thus, the speed of the arm 11, 12 or 13 which reaches the station C begins to decrease while such arm moves away from the adjacent pocket 28 which continues to advance at a constant speed in the direction of arrows 31, namely toward a station D where the blanks 24 are folded by folding members 36 which are pivotably mounted on a third conveyor 34 in the form of a rotor nearly completely surrounded by the second conveyor 29. The rotor 34 is driven by the conveyor 29 or by a discrete prime mover at the exact speed of the pockets 28 and in a clockwise direction (arrows 31) as seen in FIGS. 1 and 2.

That portion of the path for the pockets 28 which extends from the station C toward, past and beyond the station D and on to a station E is inwardly adjacent

a stationary arcuate folding member 37 serving to fold that portion of each blank 24 which is the last to leave the respective pouch 17, 18 or 19 during movement of a pocket 28 beyond the station C, i.e., when the speed of the arm 11, 12 or 13 advancing from the station C toward the station A begins to decrease so that the conveyor 29 pulls the innermost portion of the blank 24 from the respective pouch. The folding members 36 act upon the adjacent blanks 24 at the station D and serve to provide the respective blanks with relatively wide flaps 66 (FIG. 4d) at the respective (bottom) ends VI of the corresponding commodities 1. The folding member 37 serves to fold successive blanks 24 along the adjacent narrow sides III of the commodities 1 (see FIG. 4c).

The station E is followed by a station F, and that portion of the path (arrows 31) for the second conveyor 29 which extends between the stations E and F overlies a fourth conveyor 39 of the packing machine substantially in the same way as described for the conveyors 9 and 29 between the stations B and C. The conveyor 39 is a turret which carries pivotable folding members 44 and is driven to rotate in the direction of arrow 38, i.e., to move its folding members 44 in the same direction as the direction of movement of adjacent pockets 28 on the endless chain 30 of the conveyor 29. The speed of the turret 39 matches the speed of the conveyor 29, and this turret is provided with radially extending pockets 41 each of which accommodates a radially reciprocable pusher 42. The folding members 44 are used to fold successive blanks 24 jointly with corresponding nonmetallic second blanks 8 at the station G in a manner as shown in FIG. 4f to complete the conversion of blanks 24 into tubes and to convert the respective blanks 8 into U-shaped bodies each of which surrounds the two major sides and one narrow side of the

respective commodity 1. The turret 39 further carries pairs of movable folding members 43 each of which provides the adjacent blanks 24 and 8 with interfolded or interfitted narrow flaps 67 and 68 (FIG. 4f).

The turret 39 advances its pockets 41 along a stationary arcuate folding member 46 which extends from the station H toward and beyond a station I (FIGS. 1 and 3). The blanks which advance past the station I are acted upon by a stationary folding member 47 which is adjacent one axial end of the turret 39.

The reference character 48 denotes two endless belt conveyors and two rolls which cooperate to deliver a series of nonmetallic blanks 8 from a suitable source (not shown) in such a way that each blank 8 overlies the peripheral surface of the turret 39 between two neighboring pockets 41. The blanks 8 can be attracted to the peripheral surface of the conveyor 39 by suction or they can be mechanically urged against the turret, in part by the folding member 46 and in part by a portion of an endless fifth conveyor 50 which is or can be identical with the second conveyor 29.

The turret 39 further cooperates with a blank transferring or shifting unit 49 which is located downstream of the station I and upstream of the station E. The shifting unit 49 includes a set of three rolls which serve to lift successive blanks 8 off the peripheral surface of the turret 39 and to thus lengthen the path of successive blanks 8 prior to returning them onto the turret in such a way that each returned blank 8 overlies the open radially outermost end of one of the pockets 41. The arrangement is such that the open outer end of each pocket 41 is overlapped by the central portion of the respective (returned) nonmetallic blank 8.

The fifth conveyor 50 is driven to move its pockets 51 in the direction of arrows 38', i.e., in such

a way that the pockets 51 which approach and advance past a station J (downstream of the station I) move in the same direction (arrow 38) as the pockets 41 of the turret 39. Each pocket 51 contains a radially reciprocable pusher 52 and is adjacent a discrete folding member 53. The lower loop (as seen in FIGS. 1 and 3) of the eight-shaped conveyor 50 surrounds and moves in synchronism with a sixth conveyor 54 in the form of a rotor which is analogous to or identical with the conveyor (rotor 34) within the confines of the second conveyor 29. The rotor 54 carries pivotable folding members 56 which act upon successive blanks at a station K following the station J. The folding members 53 of the conveyor 50 act upon the blanks at the station J during transfer of commodities 1 and blanks 24, 8 from the pockets 41 of the turret 39 into the registering pockets 51.

A stationary folding member 57 is adjacent one axial end of the rotor 54 at a station L which follows the station K (as seen in the direction of arrows 38'). Those pockets 51 of the conveyor 50 which advance beyond the station L and beyond the rotor 54 move along a seventh conveyor 58 which is analogous to or identical with the aforediscussed three-armed conveyor 9. The purpose of the conveyor 58 is to accept finished soft packs 6 from the pockets 51 of the conveyor 50 while the pockets of its arms move at the speed of the conveyor 50, and to be relieved of soft packs while its arms are at a standstill adjacent a machine 59 which provides the packs 6 with customary revenue labels in a manner not forming part of the present invention. The arrow 61 indicates in FIG. 1 the direction of delivery of revenue labels to soft packs 6 in the machine 59. The soft packs 6 which are provided with revenue labels are gathered on a conveyor 62 which delivers them to the next processing station, particularly to a cellophaning machine which

provides each soft pack with a transparent or translucent third or outermost envelope which preferably includes a standard tear strip to facilitate opening of the pack.

The operation of the packing machine of FIGS. 1 to 3 is as follows:

FIG. 2 shows that the arm 11 of the first conveyor 9 is located at the station A and is at a standstill so that one end of the pocket 14 is aligned with a filled cell 3 of the intermittently driven chain conveyor 2. The direction in which the chain conveyor 2 is driven in stepwise fashion (so as to advance successive loaded or filled cells 3 to the station A) is indicated by arrow 63. The arrangement is such that the filled cell 3 at the station A is located in front of or behind the plane of FIG. 2 and in exact alignment with the open side of the pocket 14. The arm 11 is at a standstill, the same as the chain conveyor 2. The open radially outermost end of the pouch 17 is in register with the nip 21 of the advancing rolls 22, and these rolls are driven to advance the leader of the web 7 into the pouch 17 until the length of the web 7 between the axis of the first conveyor 9 and the nip 21 reaches a predetermined value at which time the cutting device 23 is actuated to sever the web 7 and to thus form a blank 24 the major portion of which is received in the pouch 17 adjacent one major side of the pocket 14. The pocket 14 receives the commodity 1 from the adjacent (registering) cell 3 in response to actuation of a pusher (not shown) which moves at right angles to the plane of FIG. 1 or 2 and completes the transfer before the chain conveyor 2 and the arm 11 of the conveyor 9 are set in motion. The corresponding positions of the commodity 1 (in the pocket 14) and of the blank 24 (in the pouch 17) are shown FIG. 4a. The median portion of the blank 24 in the pouch 17 is adjacent but slightly spaced apart from the major side

II of the commodity 1 in the pocket 14.

The next step involves acceleration of the arm 11 from zero speed to the speed of the conveyor 29 during travel (arrow 26) from the station A to the station B. The blank 24 in the pouch 17 can but need not be mechanically urged against, or pneumatically attracted to, the walls of this pouch while its radially outwardly extending portion advances along and is folded by the stationary folding member 27 between the stations A and B. This results in conversion of the blank 24 into an L-shaped body (FIG. 4b) which extends adjacent the major side II and the narrow side IV of the commodity 1 in the pocket 14. The configuration of the thus partially folded or deformed blank 24 corresponds to that of the blank 24 in the pouch 18 of the arm 12 at the station B of FIG. 2.

As the arm 12 advances from the station B toward the station C, its (filled) pocket 15 registers with the adjacent (empty) pocket 28 of the second conveyor 29 and such pockets move at the same speed in the direction of arrows 31. The pusher 134 in the radially innermost portion of the pocket 15 is caused to move radially outwardly in response to engagement with a stationary cam (not shown) which is adjacent the path of movement of the arm 12 beyond the station B (or in any other suitable way) whereby the commodity 1 is transferred from the pocket 15 into the adjacent pocket 28 and the commodity pushes in front of it that portion of the blank 24 which overlies the open radially outermost end of the pocket 15. This results in partial conversion of the L-shaped blank 24 (FIG. 4b) into a nearly tubular blank of FIG. 4c. The remaining part of such conversion is carried out by the stationary folding member 37 which extends from the station C toward, past and beyond the station D, e.g., all the way to the

station E.

FIG. 2 shows that the pocket 16 of the arm 13 is already empty while a portion of the blank 24 still extends into the respective pouch 19 but is in the process of being extracted because the pocket 28 which has received the commodity 1 from the pocket 16 continues to advance at a constant speed but the arm 13 undergoes deceleration on its way back toward the station A. Dragging or pulling of the trailing portion of a blank 24 from the respective pouch 17, 18 or 19 (note the pouch 19 in FIG. 2) results in a movement of median portion of such blank into direct contact with the adjacent major side II of the respective commodity 1 (it is to be recalled that the blank 24 in a pouch is not in direct contact with the commodity in the adjacent pocket 14, 15 or 16 until the respective pusher 134 begins to transfer the commodity into the registering pocket 28 of the second conveyor 29).

The transferring of a blank 24 from the pouch 17, 18 or 19 into the adjacent pocket 28 further entails the making of a narrow flap 64 at the top end V of the respective commodity 1 (FIG. 4c) because the blank 24 is caused to move past the respective folding member 32 on the conveyor 29. Such making of the narrow flap 64 is completed not later than at the station C, i.e., when the transfer of the commodity 1 from the pocket 15 of the arm 13 into the then registering pocket 28 of the conveyer 29 is completed.

The stationary folding member 37 completes the folding of the blank 24 along the narrow side III of the respective commodity 1, and one pivotable folding member 36 of the rotor 34 is caused to provide the blank 24 with a wide flap 66 (FIG. 4d) during travel past the station D. The flap 66 is provided at the bottom end VI of the respective commodity 1. It is to be noted that the

positions of the commodity 1 and blank 24 which are shown in FIG. 4d are turned through 180 degrees with reference to those shown in FIG. 4c in order to clearly show the wide flap 66 at the bottom end VI of the respective commodity.

The commodity 1 and the corresponding blank 24 are transported from the station D to the station E in a condition as shown in FIG. 4d, i.e., with the conversion of blank 24 into a tube nearly completed. At the same time, the turret 39 delivers toward the station E a nonmetallic blank 8 overlying the open outermost portion of the pocket 41 which is about to register with the foremost pocket 28 containing a commodity 1 and a blank 24. As explained above, successive blanks 8 are delivered onto the peripheral surface of the turret 39 between neighboring pockets 41; however, the rollers of the shifting unit 49 act upon successive blanks 8 ahead of the station E so that each blank 8 which reaches the station E overlies the adjacent empty pocket 41. FIG. 4e shows the mutual positions of the commodity 1 and blanks 24, 8 which meet at the station E.

The foremost filled pocket 28 then continues to advance in the direction of arrows 31 (i.e., beyond the station E), together with the registering empty pocket 41, and the corresponding pusher 33 transfers the commodity 1 and the blank 24 from the pocket 28 with attendant deformation of the blank 8 jointly with the blank 24. The blank 24 is converted into a tube (FIG. 4f) and the blank 8 is simultaneously converted into a U-shaped body which surrounds three sides of the blank 24, namely, the sides I, II and III of the respective commodity 1. The freshly filled pocket 41 advances to the station F where the two movable folding members 43 provide the blanks 24 and 8 with narrow flaps 67 at the top end V and with narrow flaps 68 at the bottom end VI

of the respective commodity 1. This is shown in FIG. 4f which illustrates the parts 1, 24 and 8 in two different views, namely from the top end V and from the bottom end VI of the respective commodity 1.

The group of parts 1, 24, 8 then reaches the station G where the respective folding member 44 which provides the blanks 24 and 8 with jointly formed wide flaps 69 (FIG. 4g) at the top end V of the commodity 1. The pocket 41 then advances to the station H and the blank 8 is folded by the stationary folding member 46 which completes the conversion of this blank into a tube (see FIG. 4h).

The structure which is shown in FIG. 4h then advances past the stationary folding member 47 (see particularly FIG. 3) which forms the wide folds 71 (shown in FIG. 4i) at and downstream of the station I. This completes the folding of those end portions of the blanks 24 and 8 which have extended or projected beyond the top end V of the respective commodity 1.

It is clear that the nonmetallic blanks 8 are or can be provided with films of adhesive which ensures that the folded portions of the blanks do not open up prior to entering the aforementioned cellophaning machine.

The structure of FIG. 4i then advances toward the station J and the respective pusher 42 is actuated to expel the commodity 1 and the blanks 24, 8 into the registering pocket 51 of the conveyor 50. This results in joint folding of the blanks 24, 8 by the respective folding members 53 to form the narrow flaps 72 (FIG. 4j). The making of the jointly formed flaps 72 is completed at the station J. The structure of FIG. 4j then advances to the station K where the respective pivotable folding member 56 provides the blanks 24, 8 with jointly formed wide flaps 73 which overlie the adjacent narrow flaps 68

and 72 (see FIG. 4k). The parts 1, 24 and 8 then advance to the station L where the blanks 24 and 8 are jointly acted upon by the stationary folding member 57 which provides the two blanks with jointly formed wide flaps 74 (FIG. 4l) which overlie the outer flap 73 and thus complete the conversion of the component 1 and the respective blanks 24, 8 into a soft pack 6.

FIG. 5 shows a partly finished soft pack, and particularly the narrow and wide flaps 68, 72 and 73, 74 at the bottom end VI of the component 1. It can be readily seen that the wide flap 73 consists of interfolded or interfitted or form-lockingly assembled portions of the blanks 24 and 8.

Soft packs 6, the making of which is completed in the pockets 51 of the conveyor 50, are transferred into the pockets 76 in successive arms of the rotor 58 while the arms are moved at the speed of the chain conveyor which forms part of the conveyor 50. The arms of the rotor 58 are then advanced to the machine 59 where they come to a standstill and are relieved of soft packs 6 which are provided with revenue labels (supplied in the direction of arrow 61), and the thus labeled soft packs are gathered by the conveyor 62 for introduction into the cellophaning machine.

An important advantage of the improved method is that the making of soft packs requires a relatively small number of successive steps. This is due to the fact that several folding operations upon the inner blanks 24 take place jointly with folding of the respective outer blanks 8. As can be seen in FIG. 4e, the second or outer blank 8 is delivered to the respective commodity 1 before the conversion of the first or inner blank 24 into a tube is completed. Thus, and as shown in FIG. 4f, the last step of converting the blank 24 into a tube takes place simultaneously with one of the

steps of converting the outer blank 8 into a tube. Such one step of folding the outer blank 8 results in conversion of the outer blank into a U-shaped body. Each of the two narrow flaps 68, 72 and at least one (73) of the two wide flaps 73, 74 at the bottom end VI of each commodity 1 are formed by jointly folding the inner and outer blanks 24 and 8. Thus, at least one flap at the bottom end VI of the commodity 1 forming part of a finished soft pack 6 consists of interfolded end portions of both blanks. Such one flap is the flap 73.

An apparatus which is similar to the apparatus for the practice of the method of the present invention is disclosed in our commonly owned copending European Patent Application No. 88 109 116.9 for "Method of and apparatus for packing rod-shaped articles of the tobacco processing industry".

A device which can gather arrays of rod-shaped articles for use in an apparatus for the practice of the method of the present invention is disclosed in our commonly owned copending European Patent Application No. 88 110 451.7 for "Apparatus for transferring block-shaped groups of rod-shaped articles of the tobacco processing industry".

An apparatus which can be utilized for the practice of the method of the present invention is disclosed in commonly owned copending patent application Serial No. 8916405 filed July 18, 1989 by Samutt Bamrungbheut et al. for "Method of and apparatus for making cigarette packs and the like".

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic and specific aspects of my contribution to the art and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the appended claims.

CLAIMS

1. A method of draping at least two foldable blanks around a box-shaped commodity which contains parallel rod-shaped articles of the tobacco processing industry and has two major sides, two narrow sides alternating with the major sides, a top end and a bottom end, comprising a plurality of first folding steps to convert the blanks into tubes one of which surrounds the other and which surround the major and narrow sides and have end portions projecting beyond the ends of the commodity; and a plurality of second folding steps to move the end portions of the tubes against the respective ends of the commodity, at least two of said folding steps including jointly folding the at least two blanks.

2. The method of claim 1, wherein at least one of said at least two folding steps is one of said first folding steps.

3. The method of claim 1, wherein said at least two folding steps include two second folding steps.

4. The method of claim 1, wherein said first and second folding steps include conversion of one of said at least two blanks into an inner envelope adjacent the commodity and conversion of the other of said at least two blanks into an outer envelope which surrounds the inner envelope.

5. The method of claim 4, wherein said first folding steps include partial conversion of the one blank into a tube prior to start of conversion of the other blank into a tube.

6. The method of claim 4, wherein said first folding steps include a step of completing conversion of the one blank into a tube, said completing step constituting one of said at least two folding steps.

7. The method of claim 4, wherein one of said at least two steps includes converting the other blank into a U-shaped body.

8. The method of claim 1, wherein said second folding steps include four steps of folding the projecting end portions of the tubes against the bottom end of the commodity, three of said four steps including jointly folding the at least two blanks.

9. The method of claim 8, wherein said four second folding steps include converting the projecting end portions of the at least two blanks into two relatively wide first flaps adjacent the major sides and two relatively narrow flaps adjacent the narrow sides of the commodity, said three of said four steps including the making of the relatively narrow second flaps and one of the relatively wide first flaps.

10. A pack comprising a box-shaped commodity which contains parallel rod-shaped articles of the tobacco processing industry and has two major sides, two narrow sides alternating with said major sides, a top end and a bottom end; and at least two envelopes one of which closely surrounds said commodity and the other of which closely surrounds said one envelope, each of said envelopes having four flaps overlying one end of said commodity and at least one flap of said one envelope being interfolded with at least one flap of said other envelope.

11. The pack of claim 10, wherein said one end is the bottom end of said commodity.

12. The pack of claim 10, wherein said four flaps of each of said envelopes include two relatively wide flaps adjacent the major sides and two relatively narrow flaps adjacent the narrow sides of said commodity, said at least one flap of each of said envelopes being one of said relatively wide flaps.

13. The pack of claim 12, wherein the other relatively wide flaps of said envelopes overlie said interfolded relatively wide flaps.

14. The pack of claim 10, wherein said at least one flap of said one envelope is fitted into said at least one flap of said other envelope.

15. The pack of claim 10, wherein one of said envelopes comprises a metallic foil.

16. The pack of claim 10, wherein one of said envelopes contains a nonmetallic material.